

# Next Gen Searching

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[www.infotoday.com/onlinesearcher](http://www.infotoday.com/onlinesearcher)



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# What we'll cover

- Next gen technologies that affect search
- Examples of how this affects searching
- Multichannel search interfaces
- Implications for searchers
- What's on the horizon



# What is next gen searching

- Next generation technologies affect what info pros can and cannot find
- Next generation technologies loosely fall under the artificial intelligence (AI) rubric
- Overlapping technologies
- Although augmented reality (AR) and virtual reality (VR) could be construed as next gen searching, they're not part of this presentation
- Not just web search, also used by library subscription database producers

# Technologies of next gen searching

- Artificial intelligence
- Machine learning
- Semantic search
- Cognitive computing
- Deep learning
- Predictive analytics
- Natural language processing
- Neural networks
- Text analytics
- Algorithmic search
- Image recognition
- Graph technology
- Generative modeling
- GPT-3

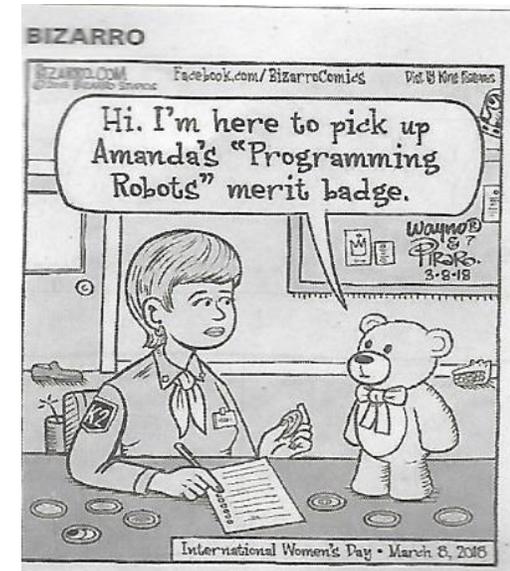
# Technology attributes

- Not entirely new technologies and they often overlap
- But enhanced because of increased computing power
  - Absorb terabytes of data in seconds
  - Identify patterns that human brain can't
  - Simulate (not replace) human brain power
  - Determine intent and context, not just literal meaning of words
- Creativity? Empathy?
- Training? Data training sets are critically important

# Science fiction speculation meets reality

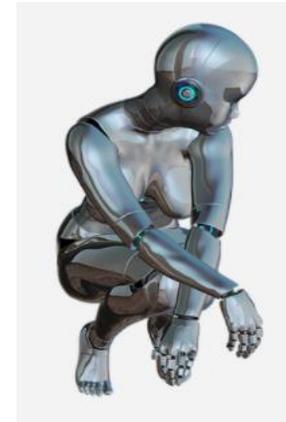
- Robots

- Replacing librarians? Chatbots, FAQs
- Biometric self-checkout and remote authentication
- Shelving, cleaning, book handling
- Teach coding skills

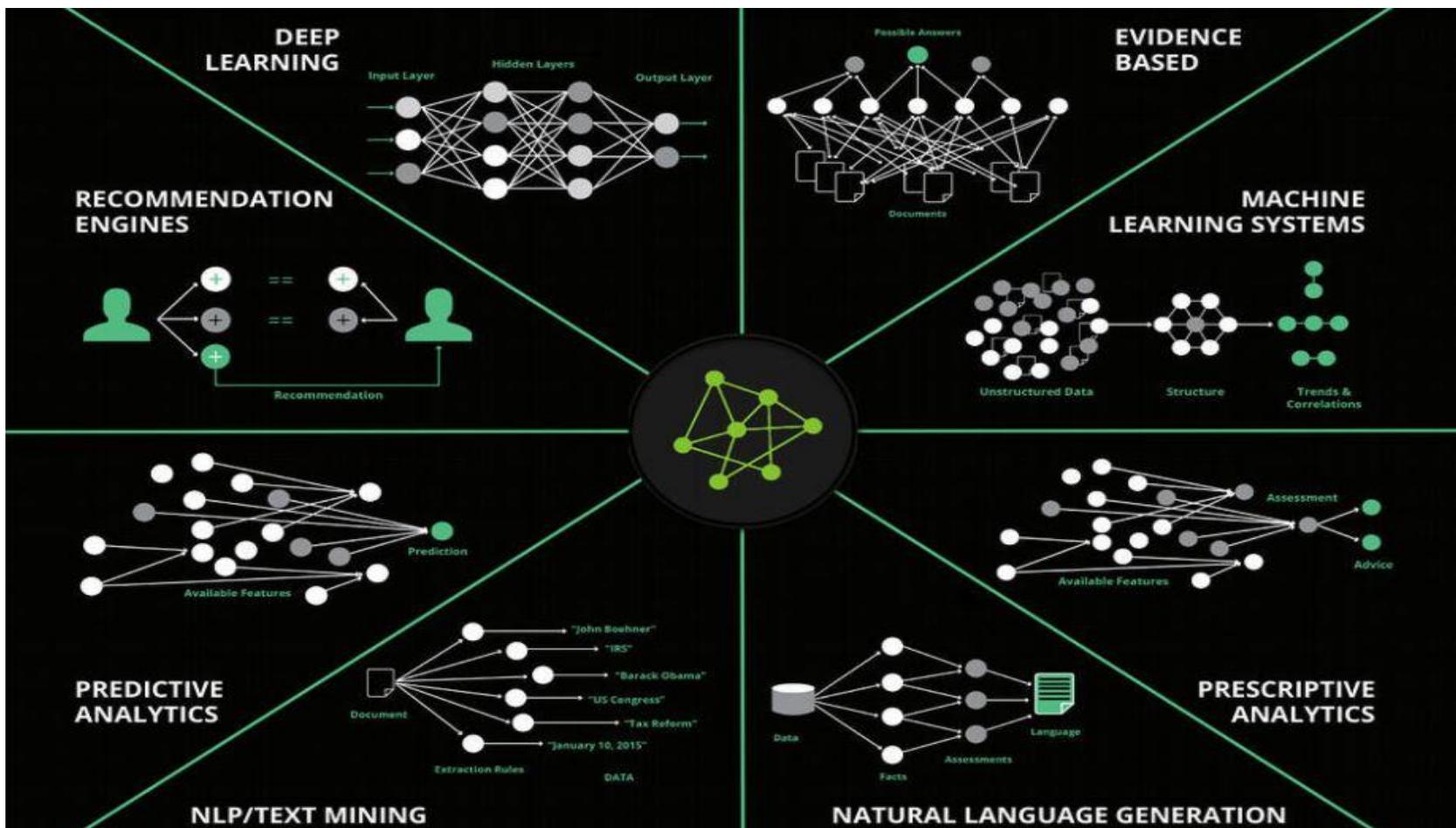


# What You Need to Know Before You Search

- Why is this being asked?
  - Known item search or topic search
  - Personal inquiry or work/school related
- Intent of the search & format required (article, ebook, statistics, image, etc.)
- Keywords versus concept
- Context of search
- Role of AI and ML



# Artificial/Augmented intelligence



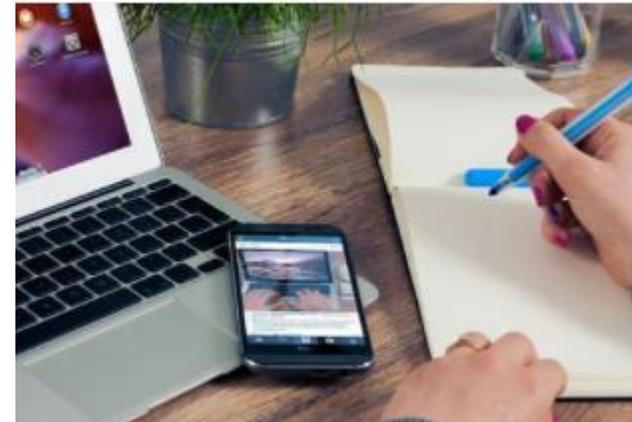
# Machine Learning

- Algorithmic writing
  - News articles (earnings reports, sports scores)
  - Investment reports (Morningstar)
- Pattern recognition
  - Reading and analyzing texts
    - Legal contracts
    - Summarization of reports
    - TL;DR antidote
- Needs large corpus to be effective
- Beware bias



# Algorithmic writing

- University of Michigan M-Write
  - Automated text analysis
  - Feedback loop
  - NLP
- Narrative Science: [narrativescience.com](http://narrativescience.com)
  - Writes stories from data
  - Natural language generation platform
- Automated Insights: [automatedinsights.com](http://automatedinsights.com)
  - Creates reports from data
- Northern Light: [northernlight.com](http://northernlight.com)
  - Uses machine learning to summarize research results
- Can algorithmic writing construct article abstracts for databases?

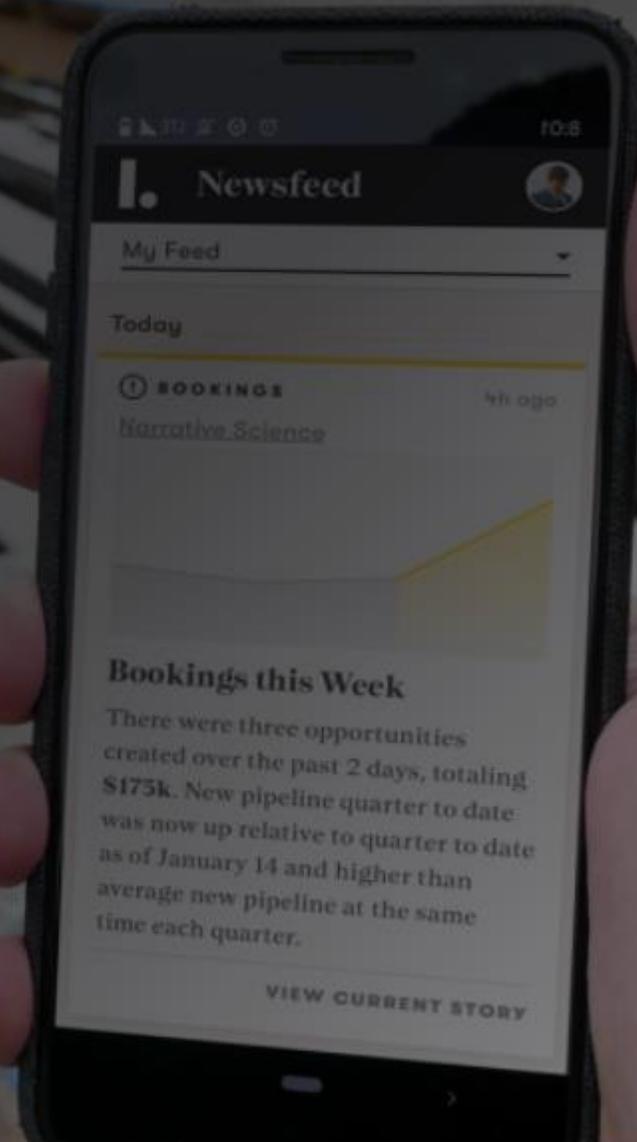


narrative  science

# Humanize analytics with ~~dashboards~~ data storytelling

Lexio is the fastest and easiest way to put insights from your business data in the hands of everyone at your company.

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Get to know Wordsmith, our natural language generation platform.

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Increasing data literacy and empowering your decisions.

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## Integrations

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[Wordsmith for Tableau](#)  
[Wordsmith for TIBCO Spotfire](#)  
[Wordsmith for Qlik](#)  
[Wordsmith for Power BI](#)

## NATURAL LANGUAGE GENERATION

Learn how NLG turns data into human sounding stories.

[Learn More →](#)

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## For analysts

Communicate insights without the risk of misinterpretation.

## For executives

Empower every employee to become data-driven.

## For any industry

We produce automated content in over 50 industries, including yours.



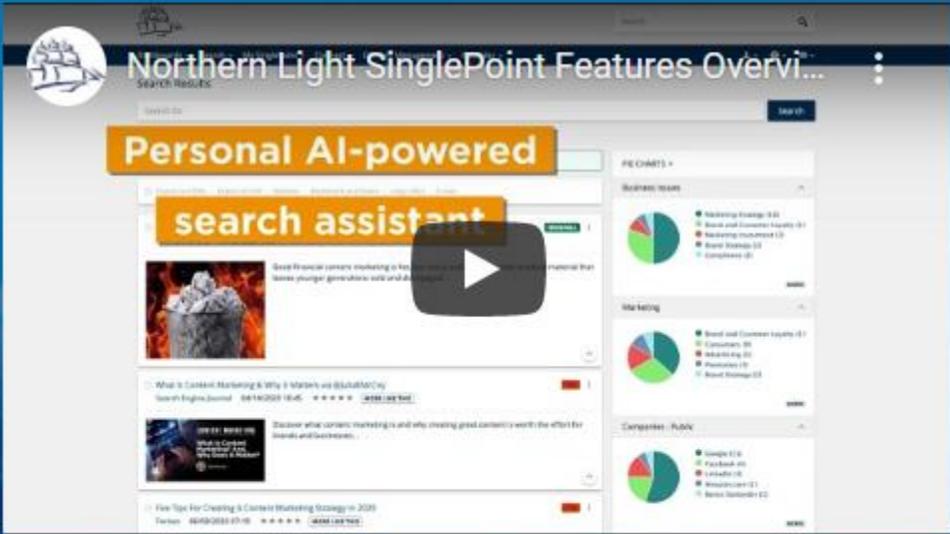
Northern Light

Let's Talk



SinglePoint delivers on the promise of research-driven competitive advantage by making information easy to find and use.

It is a custom-built enterprise knowledge management platform that seamlessly integrates and enables full-text search of all your research resources to create an invaluable market research/competitive intelligence portal.



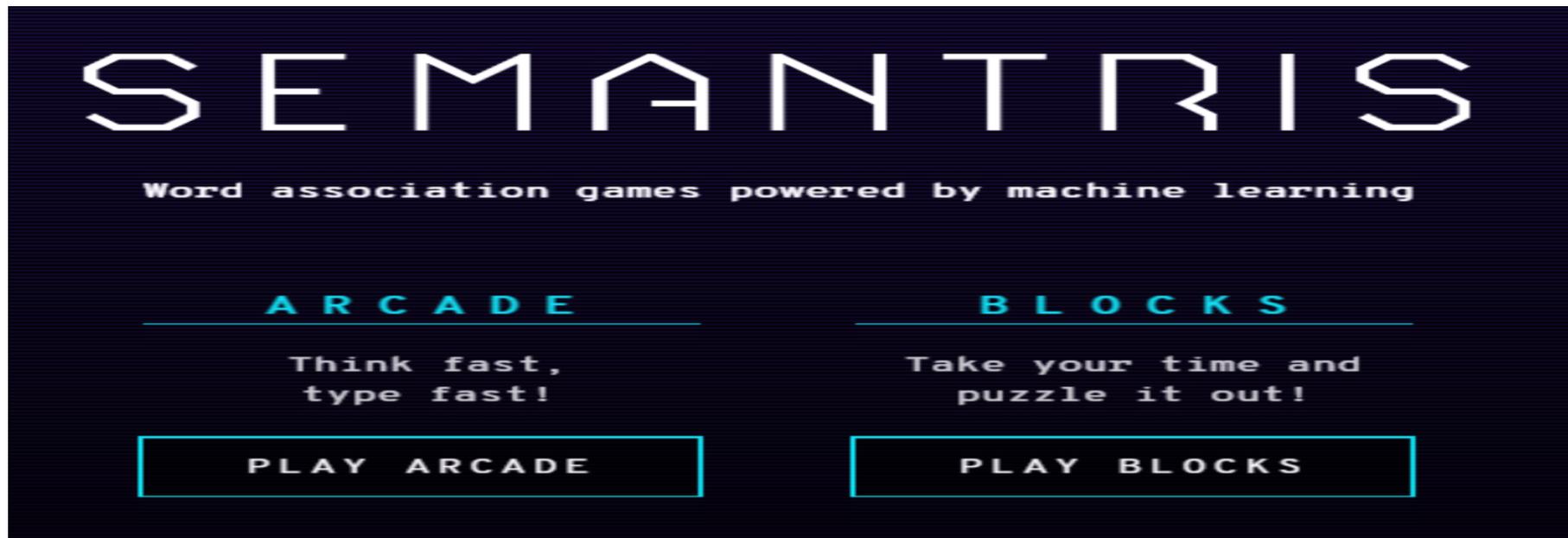
# Machine learning

- Different uses between subscription databases and web search engines
- Subscription databases
  - Did you mean?
  - Others searched for
  - Readers advisory
- Web search
  - Algorithms based on most popular search queries
  - That aren't done by librarians
  - Relevance implications



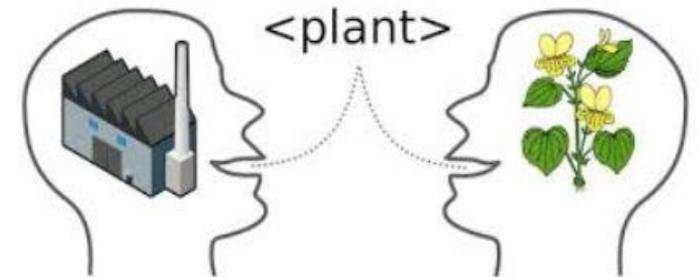
# Machine learning at Google

- It learns from the billions of searches done on Google
- It learns about language from Google Books
- It has games that teaches it language
  - Semantris, <https://research.google.com/semantris>



# Semantic search

- Understanding context
- Subscription databases tend to be literal but that is changing
- Web search and enterprise search try to analyze semantic meaning
- “Alikeness”
- Boolean OR on steroids
- Normalization of company and person names



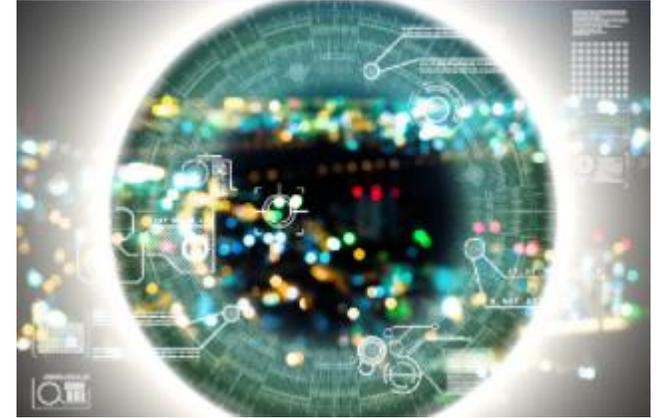
# Cognitive search/Cognitive computing

- Not just semantics but determining intent of search
- Initially popularized by IBM with its Watson technology
- Watson being used in products such as Gale's Digital Scholar Lab



# Deep learning

- Sentiment analysis
  - Identify sarcasm?
- Photo indexing
  - <https://artsexperiments.withgoogle.com/lifetags/>
- Big Data analysis
- Internet of Things data analysis
- Deep neural networks
- Advanced deep faking
- GANs



100 metres hurdles (258)  
 110 metres hurdles (1094) 1937 ford (5)  
 1941 ford (16) 1949 ford (30) 1952 ford (5)  
 1955 ford (22) 1957 chevrolet (5)  
 1957 ford (2) 3d modeling (82)  
 3x3 (basketball) (75)  
 4 × 100 metres relay (655)  
 4 × 400 metres relay (49) 800 metres (510)



a-line (426)  
 aardvark (4)  
 abacus (13)  
 abalone (7)  
 abaya (63)  
 abbess (1178)

abbey (1630) abdomen (23462)  
 abert's squirrel (1) abrasive saw (4)  
 abseiling (556) absolut vodka (2)  
 abyssinian (3)

## Ac

ac aceca (4) ac cobra (4)  
 ac greyhound (5)

costus family (4) coton de tulear (90)  
 cottage (14477) cotton candy (238)  
 cotton swab (1) couch (9439) cougar (124)  
 countertop (390)  
 country-western dance (2321)  
 coupe utility (209) course (48) court (425)  
 court shoe (343) courthouse (1491)  
 courtyard (418) cousin (5) cove (251)  
 cover-up (5) cow parsley (22)  
 cow-goat family (15810) cowbell (2)

## Cowboy

A cowboy is an animal herder who tends cattle on ranches in North America, traditionally on horseback, and often performs a multitude of other ranch-related tasks. The historic American cowboy of the late 19th century arose from the vaquero traditions of northern Mexico and became a figure of special significance and legend.

cowboy (11852)  
 cowboy action shooting (45)  
 cowboy boot (14) cowboy hat (8299)

cowfish (5) cowslip (7) coxswain (821)  
 coyote (122) cpu (1) crab (195)  
 crab boil (2) cracker (1) cradle (14)  
 craft (232) cranachan (2)

## King

King is the title given to a male monarch in a variety of contexts. The female equivalent is queen regnant (while the title of queen on its own usually refers to the consort of a king). In the context of prehistory, antiquity and contemporary indigenous peoples, the title may refer to tribal kingship.

king charles spaniel (56) king cobra (4)  
 king crab (38) king penguin (116)  
 king shepherd (47) king vulture (6)

kingsnake (51) kinkajou (44)  
 kinomichi (498) kinosternidae (43)  
 kintamani (8) kiosk (31) kippah (9)  
 kishu (13) kiss (3279) kit car (17)  
 kit fox (20)

## Kitchen

A kitchen is a room or part of a room used for cooking and food preparation in a dwelling or in a commercial establishment. In the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the agricultural commodity with the third-highest worldwide production, after sugarcane and maize, according to 2012 FAOSTAT data. Since a large portion of maize crops are grown for purposes other than human consumption, rice is the most important grain with regard to human nutrition and caloric intake, providing more than one-fifth of the calories consumed worldwide by humans. Wild rice, from which the crop was developed, may have its native range in Australia.

kitchen (6143)  
 kitchen & dining room table (268)  
 kitchen appliance (2276) kitchen knife (2)  
 kitchen sink (11) kitchen stove (509)  
 kitchen towel (1) kitchen utensil (198)

rhesus macaque (588) rhinoceros (326)  
 rhinoceros beetle (18)  
 rhodesian ridgeback (42) rhododendron (113)  
 rhododendron catawbiense (6) rhubarb (1)  
 rhythmic gymnastics (137) rib (86)

## Ribbon

A ribbon or riband is a thin band of material, typically cloth but also plastic or sometimes metal, used primarily as decorative binding and tying. Cloth ribbons are made of natural materials such as silk, velvet, cotton, and jute and of synthetic materials, such as polyester, nylon, and polypropylene.

ribbon (15)  
 ribbon (rhythmic gymnastics) (1)  
 ribbon snake (2)

## Rice

Rice is the seed of the grass species *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice). As a cereal grain, it is the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the agricultural commodity with the third-highest worldwide production, after sugarcane and maize, according to 2012 FAOSTAT data. Since a large portion of maize crops are grown for purposes other than human consumption, rice is the most important grain with regard to human nutrition and caloric intake, providing more than one-fifth of the calories consumed worldwide by humans. Wild rice, from which the crop was developed, may have its native range in Australia.

rice (7) rice cooker (11) rice flour (12)

# Indexing, metadata

- AI to determine good indexing terms, apply metadata
- Relies on machine learning
- American Archive of Public Broadcasting: [americanarchive.org](http://americanarchive.org)
  - WGBH & LoC
  - OCR to extract text, facial recognition
  - Citizen archivists supplement AI programs
- Will this replace thesauri?



*a collaboration between the Library of Congress and WGBH*

# Predictive Analytics

- Part of web search algorithms
- Filter bubble
- Geography, previous searches, what you've clicked on
- Geared towards non-information professionals



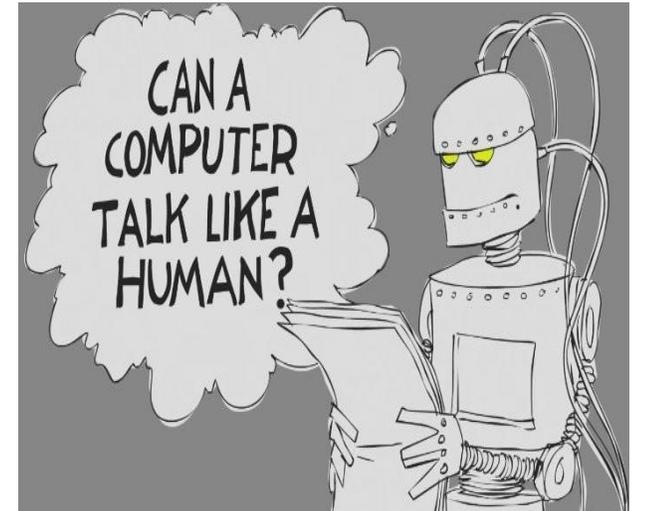
# Predictive Analytics and Display of Results

## Custom displays of results

<b>Not Just a List of Links</b>	
Dashboards	Badges
Images	Charts
Graphics	Icons
Snippets	Emails
Emojis	News Articles
Movie Clips	Audio Clips

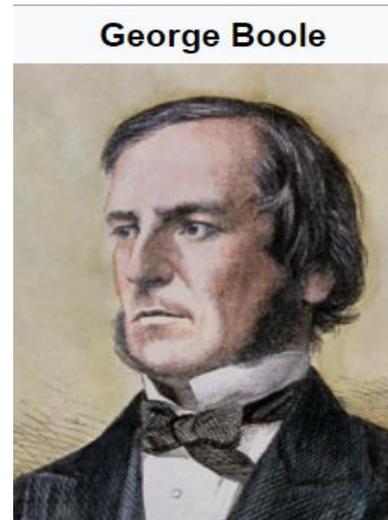
# Natural Language Processing (NLP)

- Combines linguistics, computer science and AI
- Computer understanding of human language
  - NLP makes it possible for computers to
    - read text, hear speech, interpret it, measure sentiment
    - determine which parts are important.
- Not new technology but many new developments
- Analyzing patents



# Boolean Logic and Beyond

- AND, OR, NOT, XOR
  - Nesting
  - Adjacency
  - Bound phrases
  - Keyword searching
  - Math + Text
- 
- Boolean logic may not be logical to web search engines



# Let's Count Parens

- ((social media OR social networking OR facebook) AND (behaviour OR behavior) AND (south africa OR kenya OR namibia OR mozambique or lesotho OR swaziland)) NOT (twitter OR instagram)
- Google assumes an implicit AND Instagram does not recognize NOT
- ((social media OR social networking OR facebook) (behaviour OR behavior) (south africa OR kenya OR namibia OR mozambique or lesotho OR swaziland)) -(twitter OR instagram)
- But it doesn't really work very well

## Related searches :

🔍 social media in africa 2020

🔍 social media usage in africa 2020

🔍 most popular social media in africa

🔍 social media in africa pdf

🔍 social media users in africa 2020

🔍 most used social media in south africa 2021

🔍 history of social media in africa

🔍 south african social media apps

*In order to show you the most relevant results, we have omitted some entries very similar to the 17 already displayed.*

*If you like, you can [repeat the search with the omitted results included](#).*

# Twitter not NOTted out, OR not recognized

About 8 results (1.34 seconds)

[www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov) > [pmc](#) > [articles](#) > [PMC7108283](#) ⋮

## [The emerging use of social media for health-related purposes ...](#)

by E Hagg · 2018 · Cited by 51 — These websites support functions such as **social networking** (e.g., **Facebook**, ... or **twitter** or **instagram** or myspace or blog<sup>a</sup> or tumblr) AND ((Health ... (2017), Computers in Human **Behavior**, The impact of **social media** on risk ... **social networking** platform, Quantitative Research, **South Africa**, MXit **social networking** tool, X.

[qz.com](http://qz.com) > [africa](#) > [lesotho-uganda-tanzania-introduce-so...](#) ⋮

## [Lesotho, Uganda, Tanzania introduce social media rules ...](#)

Oct 11, 2020 — More African governments are quietly tightening rules and laws on **social media**. REUTERS/Phil Noble. WhatsApp and **Facebook** messenger ...  
Missing: {behaviour} | Must include: {behaviour}

[www.voanews.com](http://www.voanews.com) > [africa](#) > [tiny-african-nation-lesoth...](#) ⋮

## [Tiny African Nation of Lesotho Proposes Social Media Limits ...](#)

Oct 15, 2020 — JOHANNESBERG, **SOUTH AFRICA** - Journalists and **media** freedom activists are objecting to a government proposal in the African nation of ...  
Missing: {behaviour} | Must include: {behaviour}

# Multiple Formats

- Online searching pre-web was all about words and structured data
- Now we have many different formats:
  - Unstructured texts (emails, blog posts, status updates, social media, conversations, notes, contracts)
  - Images, photographs, drawings, graphs, charts
  - Video, audio
  - Numeric data
- Information has escaped from its narrow boundaries
- Is everything searchable?



# Search Becomes Smart(er)

- From Get Smart to Smartphones





# Google

- Google processes billions of queries each day
- Machine learning helps it determine “best” answer (at least in English)
- Relevancy based on popularity
- Neural matching to build synonyms; RankBrain to relate pages to concepts
- Advanced search features discontinued/not supported because it happens automatically behind the scenes
- Personalization, Predictive analytics
- Google Lens: machine learning algorithms in TensorFlow, Google Image Search as a training set, and Google’s Knowledge Graph

# Bing



- Not as many queries as Google, but enough to use machine learning in similar fashion
- Semantic technologies
- Parse query to determine intent
- Upgraded text to speech capabilities in voice search (more human)
- Intelligent answers capable of answering complex questions based on Bing's deep learning models
- Its latest enhancements rooted in AI

# Zero Click Answers

- Just answer my question, don't give me a bunch of links
- Put answer as the first link
- Use knowledge graph technology
- But is it the correct answer?
- It helps to ask the right question



who won the civil war



All

Images

News

Videos

Books

More

Settings

Tools

About 279,000,000 results (0.97 seconds)



Fact #8: The **North** won the Civil War.

After four years of conflict, the major Confederate armies surrendered to **the United States** in April of 1865 at Appomattox Court House and Bennett Place.

**Combatants:** United States, Confederate States ...

**Military personnel involved:** Abraham Lincoln

[10 Facts: What Everyone Should Know About the Civil War ...](#)

[www.battlefields.org](http://www.battlefields.org) > [learn](#) > [articles](#) > [10-facts-what-everyone-should-kno...](#)



About Featured Snippets



Feedback

who won the spanish civil war



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Tools

About 171,000,000 results (1.38 seconds)

## Franco

On March 28, 1939, the Republicans finally surrendered Madrid, bringing the Spanish Civil War to an **end**. Up to a million lives were lost in the conflict, the most devastating in Spanish history. **Franco** subsequently served as dictator of Spain until his **death** in 1975.

### [Spanish Civil War breaks out - HISTORY](#)

[www.history.com](#) › [this-day-in-history](#) › [spanish-civil-war-breaks-out](#)



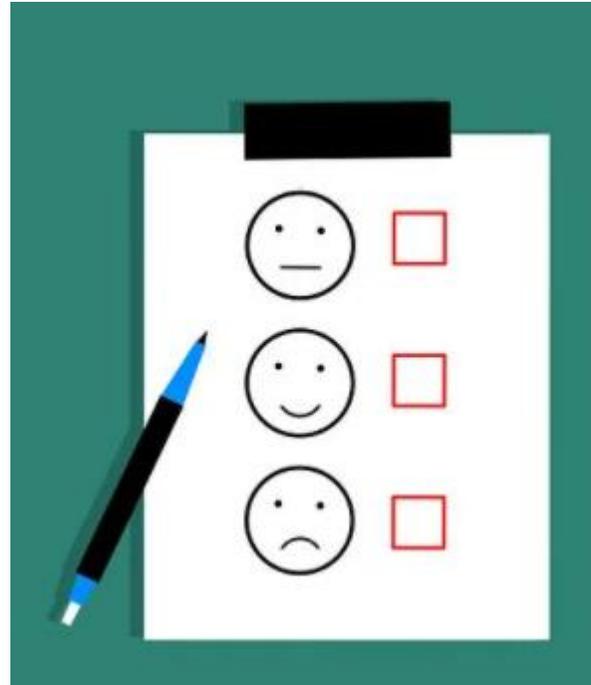
About Featured Snippets



Feedback

# Web Search Engines Use of AI

- Auto complete
- Auto suggest
- Did you mean?
- Others searched for
- What is intent of search?
- Sentiment analysis



# Bing & Google & Misspellllllings

- Bing

Including results for machine **learning**.  
Do you want results only for machine larning?

- Google

Showing results for machine **learning**  
Search instead for machine larning

# Algorithms

- Web search results are based on algorithms
- Algorithms that we don't know
- Algorithms that constantly change
- Black box of search
- What does relevancy mean to an algorithm?



# Generative modeling and GPT-3

- Artificial general intelligence, draws from multiple sources
- GANs produce deep fake images of people's faces
- API for GPT-3 from [openai.com](https://openai.com)
  - Generative Pre-trained Transformer
  - Uses deep learning to produce human-like text
  - Language modeler with 175 billion parameters, text synthesizer
  - It can write short stories, songs, technical manuals, press releases, web page layouts, computer code
  - Huge possibility for bias

# How AI technologies affect specific domains

- Scholarly literature
- Academic search engines
- Scholarly publishing
- Science
- Legal
- Current awareness

# Scholarly literature

- Data mining, text mining for Digital Humanities, Digital Social Sciences
- SemanticScholar.org from Allen Institute for Artificial Intelligence (AI2)
  - Computer science
  - Medicine
- Iris.ai – Knowledge base is CORE.ac.uk; algorithms for word usage frequency and relevance ranking
- Dimensions from Digital Science (digital-science.com/products/dimensions): just partnered with Google Cloud
- Quertle for biomedical literature (quetzal-search.info )
- Wizdom.ai

Sign In

Create Free Account



# SEMANTIC SCHOLAR

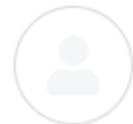
A free, AI-powered research tool for scientific literature

Search 189,769,916 papers from all fields of science

Search 🔍

ry: [Influenza](#) · [Virology](#) · [Epidemic Modeling](#)

## About 182,000 results for “influenza”

[All Fields ▾](#)
[Date Range ▾](#)
[Has PDF](#)
[Publication Type ▾](#)
[Author ▾](#)
[Journals & Conferences ▾](#)
[Sort by Relevance ▾](#)


**the Novel Influenza  
A Pregnancy  
Working Group**  
1 publication • 867  
citations



**Influenza Team**  
17 publications • 55  
citations



**Global Seasonal  
Influenza-  
associated  
Mortality Collaborat  
Network**  
1 publication • 454  
citations

[Show All Authors](#)

### Evolution and ecology of influenza A viruses.

Sun-Woo Yoon, R. Webby, R. Webster · Medicine, Biology · Current topics in microbiology and immunology · 2014

Wild aquatic bird populations have long been considered the natural reservoir for **influenza** A viruses with virus transmission from these birds seeding other avian and mammalian hosts. While most... [Expand](#)

 **3,436**

 [View on PubMed](#)  [Save](#)  [Alert](#)  [Cite](#)  [Research Feed](#)

### Estimates of global seasonal influenza-associated respiratory mortality: a modelling study

A. Iuliano, K. Roguski, H. Chang, D. Muscatello, [Global Seasonal \*\*Influenza\*\*-associated Mortality Collaborat Network](#) ·

Medicine · The Lancet · 13 December 2017

BACKGROUND Estimates of **influenza**-associated mortality are important for national and international decision making on public health priorities. Previous estimates of 250 000-500 000 annual **influenza**... [Expand](#)

### Orthomyxoviridae

A family of RNA viruses causing INFLUENZA and other diseases. There are five recognized genera: INFLUENZAVIRUS A; INFLUENZAVIRUS B; INFLUENZAVIRUS C; ISAVIRUS; and... [EXPAND](#)

[CREATE ALERT](#)
[EXPLORE TOPIC >](#)

### 50 Related topics

- Equine influenza virus A1  
Ab:Titr:Pt:Ser:Qn:HA1
- Equine influenza virus A2  
Ag:ACnc:Pt:XXX:Qn
- Influenza C Virus
- Influenza virus A Ab:PrThr:Pt:Eggylk:Ord

[VIEW ALL](#)



# Research discovery with artificial intelligence

Use Natural Language Processing to review massive collections of research papers or patents: find the right documents, extract all their key data or identify the most precise pieces of knowledge.

FOR ACADEMIA

FOR CHEMISTRY R&D

TRY THE FREE TOOL

TODAY



TBLC 2021



VISION



## Quertle: *Wisdom from Literature*<sup>™</sup>

- 
**Discover**  
 Artificial Intelligence discovers relevant articles, protocols, grants, patents & more
- 
**Analyze**  
 Predictive visual analytics provide insights that lists cannot
- 
**Explore**  
 Automatic identification of Key Concepts related to your query enables efficient exploration
- 
**Save & Discuss**  
 Save & annotate articles; discuss privately with peers
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# intelligence for institutions

Search for a Topic, Institution, Journal, etc...

Try: [University of Oxford](#) [Zika Virus](#) [United States](#) [PLoS ONE](#)

[wizdom.ai overview](#)

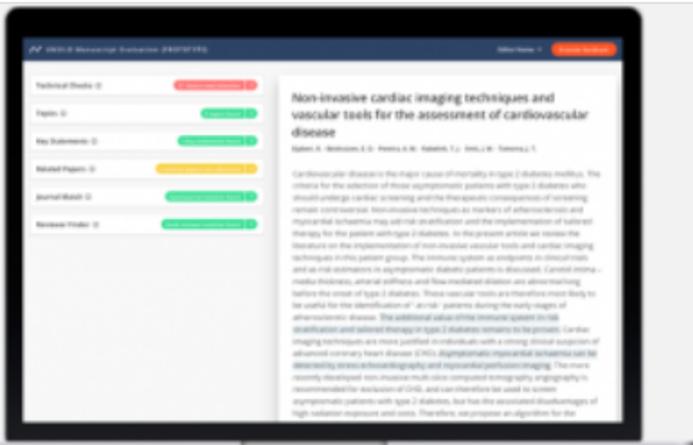
Our AI continuously monitors billions of data points about the global research ecosystem to provide actionable insights for your decision making

# Academic search engines

- Yewno.com
  - Graphic search results
  - Full-text analysis, computational semantics, neural networks, machine learning
- Sparrho.com
  - 60 million scientific articles
  - Recommendation engine based on NLP
  - Aimed at healthcare corporate market
  - Requires payment

# Scholarly publishing

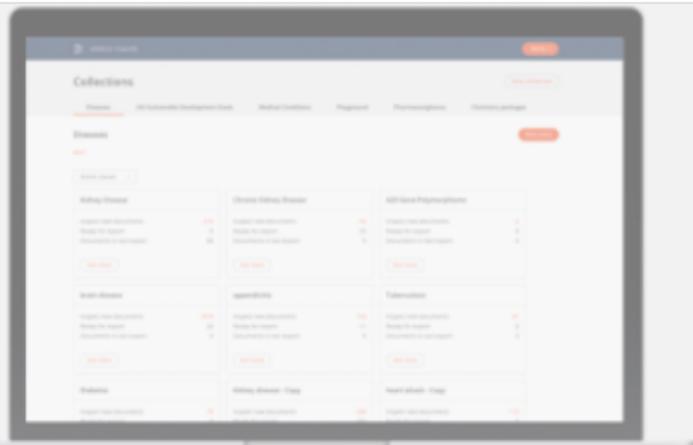
- Detection of fake articles
- Plagiarism
- UNSILO.ai: manuscript evaluation, classification, APIs
  - Journal Match uses NLP
  - Reviewer Finder for peer reviewers
  - Extraction tools
- StatReviewer.com
  - Machine learning to generate statistical and methodological reviews of scientific manuscripts
  - Guard against predatory publishers



## UNSILO Evaluate

UNSILO Evaluate scales expert and publisher capacity for manuscript preparation, screening, and publication.

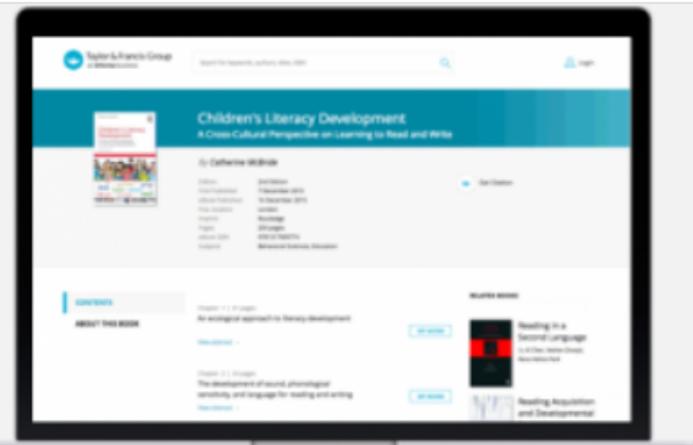
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## UNSILO Classify

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## UNSILO Recommend

UNSILO Recommend for publishers supports discovery of existing and new research and increases page views on your website.

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# Scientific searching

- Mining for Chemistry ([infochem.de](http://infochem.de))
  - Graphical structure recognition
  - Chemical named entity extraction
  - Cheminformatic technologies
- Patent literature
  - NLP from Linguamatics ([linguamatics.com](http://linguamatics.com))
  - IEEE's InnovationQ Plus ([innovationqplus.ieee.org](http://innovationqplus.ieee.org))
    - Semantic and Boolean search

# Legal searching

- Predictive analytics & Pattern Recognition
  - Judge's decisions
  - Contract review
- Bloomberg Law's Litigation Intelligence Center
- Lex Machina, a LexisNexis company – legal analytics
- Casetext's CARA tools ([casetext.com/cara-ai](https://casetext.com/cara-ai))
- Westlaw Edge

# Current awareness subscription services

- Manzama Insights: manzama.com
  - Analyze, classify and group news stories



- InfoNGen: infongen.com
  - From EPAM Systems, Inc.
  - Uses NLP and AI to classify stories
  - Text analytics and sentiment analysis



- Alpha-Sense Alerts
  - Monitoring company, industry, product news
  - Culled from unstructured information, including blogs and video
  - Also reports, news, financial data

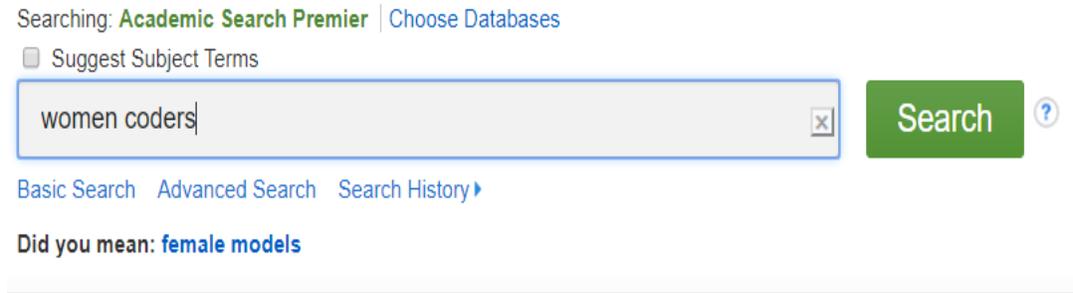


# Subscription databases

- Did you mean?
- Others searched for
- Readers advisory
- Expert.ai and EBSCO
  - Metadata enrichment and semantic tagging
- EBSCO automatic equivalencies (indigenous also retrieves native)
- How are these determined and does anyone review them?

# Things Can Change for the Better (Sort of)

- This screenshot was from several months ago:



- It now suggests “women voters”
- A search for “female coders” suggests “female riders” and “women gamers” suggests “women farmers”
- But “male gamers” suggests “male games”

# Next Generation Interfaces: Voice Search

- Voice dominates mobile search
- 50% of searches in 2020 were via voice.
- Voice recognition accuracy continues to improve

THE KEYWORD GAME VS VOICE QUERY GAME:

Past	Future
bbq in dallas	Where can I find the best ribs to eat in Dallas
best bbq in dallas	That first result looks interesting tell me more about it
best bbq in dallas tx	How much do they charge for a ribeye steak
bbq in dallas tx	Can you show me some pictures of their ribs
barbeque in dallas tx	What other things do they have on their menu
bbq restaurants in dallas	What time are they open until tonight
best bbq in dallas 2016	
bbq places in dallas	
korean bbq in dallas	
bbq dallas menu	

# Chatbots, personal assistants

- Talking your search strategy
  - Alexa, Siri, Cortana
- Talk to Books ([books.google.com/talktobooks](https://books.google.com/talktobooks))
- Search as conversation
- Entering full sentence into search box
- For library chatbots, what is the underlying knowledge base?



# Talk Books

Browse passages from books using experimental AI

[Learn more](#)



## Not a traditional search

Use this demo as a creativity tool to explore ideas and discover books by getting quotes that respond to your queries.



## Use natural language

Speaking to it in sentences will often get better results than keywords. That's because the AI is trained on human conversations.



## Play with it

Try our sample queries then try your own. Experiment with different wording to see how it changes the results.

 | Say something to books...



Go!

# Search Interfaces: Image Search

- Image Search

- TinEye.com first Image Search Engine in 2008

- Reverse Image

- Uses an image as a query instead of text
  - Metadata, Context, Patterns, Shapes, Colors, Size



# Image searching

- Facial Recognition Search
  - Widely Available
    - Facebook's Photo Review tool – alerts you when your image appears on Facebook
    - Google's Reverse Image Search
  - Multiple Applications
    - Similar Faces
    - Security
    - Copyright Infringement



# Conversational search

- Conversational in style, driven by mobile
- Ask a Question
  - What is the weather?
  - Ask for directions
  - Are there any coffee shops near me now?
  - Who won the 1984 World Series?
- Not keywords
- Enter sentences in search box



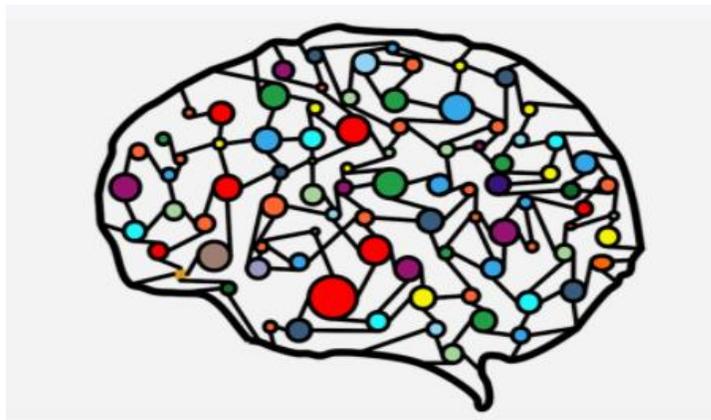
# Newest technology announced by Google

- MUM (Multitask Unified Model)
  - Trained in 75 languages
  - Handles complex queries, Searches images, text and video
  - Still a pilot project
- LaMDA (Language Model for Dialogue Applications)
  - AI lets you carry on an open-ended conversation without repeating information
  - Applications for Maps



# AI Technologies Do Not Make Search Infallible

- Human intervention and curation are necessary
- The “wisdom of crowds” works only up to a certain point
- Machines do not always know best, “human-in-the-loop” necessary
- Information professionals are not the “target market” for web search



# The future of search

- If AI determines relevancy, where is human empathy?
- Who spots anomalies
- Long tail research
- Privacy issues
- Control issues
- Cyborg librarians?
- Think it, search it, no keyboarding?
- Answers before you search?
- The end of search as we know it?



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